REMARKS/ARGUMENTS

The foregoing proposed amendment presents amended claims 7-9. Claim 20 has been added and claims 1-6 have been cancelled as unelected claims. As a result of this Amendment, claims 7-20 remain in this application.

In paragraph 2 of the Office Action, claims 7, 8 and 15-19 were rejected under 35 U.S.C. section 102(b) as being anticipated by Degani et al, U.S. Patent No. 5,346,118 ("Degani"). Although Degani discusses some similar elements to the claimed present invention, the purpose and structure of Degani are completely different from the claimed invention as amended. Degani discusses the use of an IC package 10 having a substrate having a plurality of solder bumps. Degani further discusses a board 11. There is no specific discussion in Degani as to how the substrate of IC package 10 has a different coefficient of thermal expansion (CTE) than the board 11 or how the substrate is different from the board 11 in general. The problem and concern in Degani is providing "exceptional joint volumes and reliable interconnection heights by means of a unique combination of specially optimized solder paste, ultra-thick stencil having apertures with trapezoidal crossection configuration, (See FIG. 6), and by grossly overprinting the pad areas." (See Col. 4, lines 15-20). Degani does discuss with reference to FIG. 5 the use of different solder materials (12 and 18), but for use on the same solder pad areas. In contrast, the claims of the present invention as amended recite the use of different solder materials on separate areas or solder pads as shown in FIGs. 1-3 of the present invention. Degani uses different solder paste on the same solder pad areas for the purpose of preventing parts from separating or falling off during reflow as discussed in Col. 6, lines 22-43. Again, the teachings of Degani fails to anticipate the claims of the present invention as amended since the purpose, motivation and structure disclosed in Degani is completely different than the claimed present invention. Degani fails to teach, nor suggests, mentions or contemplates selectively applied solder on different areas of the boards. Furthermore, the present invention compensates for CTE mismatch among different substrates. As discussed in Applicant's specification, differing CTEs among substrates (CTE mismatch) is evident with a typical PCB material having a CTE of 15 PPM/Degree C while a Ceramic substrate can have a CTE of 6 PPM/Degree C. Thus, cracks are initiated during the cooling process (of the reflow process) as the solder materials between the PCB and ceramic solidifies while the PCB and ceramic are not fully in a steady state. Note that Pb-free solder paste (95.5%Sn-3.8%Ag-0.7% Cu) solidifies at 217 degree C while the PCB and the Ceramic are still contracting at different rates as the temperature is reduced. As a result, cracks form in the ceramic and possibly the solder as well. Degani is resolving a different problem than the present invention and fails to discuss CTE mismatch. Wood fails to teach, nor suggests, mentions or contemplates selectively applied solder on different areas of the boards and Wood further fails to anticipate the claims of the present invention as amended since the purpose, motivation and structure disclosed in Wood is completely different than the claimed present invention.

In paragraph 3, Claims 7, 8 and 15-17 were rejected under 35 U.S.C. 102(b) as being anticipated by Wood et al, U.S. Patent No. 6,150,717 ("Wood"). Once again, as in Degani, Wood illustrates the use of different solder materials in the form of a solder ball 12M on bumped electrode 96. Once again, these two materials are used on the same solder pads and not different soldering materials on different solder pads in the same structure. Added claim 20 provides further specificity in this regard, although claim 7 as amended also incorporates this same difference. Furthermore, the purposes are not to overcome different CTE among substrates, but to provide better alignment and prevent collapse of solder bumps. Note, that although different solder is used in Wood, the solder bump 12M never liquefies. Bumped electrode 96 liquefies and forms the bonded connection 106 to the solder bump . (see col. 10, lines 1-11).

In paragraph 4 of the Office Action, claims 11 an 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wood in view of U.S. Patent No. 5,346,118 to Degani. Claims 11 and 13 claim lead-free solder. The composition of claim 11 is specifically a higher melting point lead-free solder. The use of this type of solder is one of the reasons and motivations for several embodiments of the present invention. In prior existing technologies (Wood and Degani among many others), the solder used did not have such a high melting point and therefore did not cause such stresses to the different substrates having different CTE as the solder solidified (at 217 degree C for example) and the different boards continued to contract at different rates during the cooling of the reflow process. Such a problem did not exist or was not recognized at the time of Wood and Degani and are therefore not addressed in the cited art. Furthermore, as discussed above, the structure of different solder materials on separate areas (not on the same solder pad area) is not taught or suggested by either Wood or Degani or in any combination thereof. Thus, claims 11 and 13 being dependent on a claim being believed to be novel and non-obvious, the

Applicant respectfully believes the claims of the present invention as amended overcome the rejections based on 35 U.S.C. section 102(b) based on either Wood or Degani and further would overcome any rejections based on 35 U.S.C. 103(a) as being unpatentable over Wood in view Degani.

Consequently, an indication of allowability is respectfully requested. Should any minor points remain prior to the issuance of a Notice of Allowance, the Examiner is requested to telephone the undersigned at the below listed telephone number.

Respectfully submitted,

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